

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Status of the Claims

Claims 58-77 are currently pending, with claims 58 and 68 being independent claims. Claims 1-57 were previously cancelled. Claims 65 and 66 have been amended to recite that “light emitting device emits...”. These amendments overcome the Examiner’s statement in paragraph 4 of the Office Action that the absence of a structural and/or functional limitation in claims 65 and 66 preclude these claims from being given patentable weight. In view of the amendment, however, Applicant requests the Examiner to withdraw the rejection. No new subject matter that would require a new search has been added. Applicant provides a listing of the claims for the convenience of the Examiner.

For the reasons mentioned below, Applicant believes that the pending claims are neither anticipated nor obvious over the cited references. Thus, favorable reconsideration of the application is respectfully requested.

Double Patenting

Claims 58-67 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-20 of U.S. Patent No. 6,861,658. While the Examiner acknowledges that the conflicting claims are not identical, the Examiner states that the ‘658 reference claims an apparatus for phototherapy that reads on the claimed subject matter. Applicant respectfully disagrees.

Claims 1-20 of the ‘658 patent are directed to a skin tanning chamber. In contrast, the claimed subject matter is directed to a system comprising a UV-light emitting device for phototherapeutic treatment of lupus, psoriasis, hair growth and for tooth whitening. Phototherapy requires the UV-light emitting device to emit UV-light of specific wavelengths. Thus, pending claims 58-67 are patentably distinct from claims 1-20 of the ‘658 patent. The

nonstatutory obviousness-type double patenting rejection is improper and Applicant respectfully request the Examiner to withdraw this rejection.

Claims 58-77 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-24 of co-pending Application No. 10/558,092. Applicant requests that this rejection be held in abeyance because Applicant will address this rejection or submit a terminal disclaimer when patentable subject matter has been identified.

Rejections Under 35 U.S.C. 102(e)

Claims 58, 59, 62, 66-69, 72 and 77 are rejected as being anticipated by Sullivan (U.S. Patent No. 6,602,275). Applicant respectfully traverses.

Sullivan discloses a device containing light-emitting diodes (LEDs) which is employed in phototherapy. In particular, Sullivan is focused on providing a device for phototherapeutic treatment of large livestock at a distance of several feet from the animal. Moreover, there is no disclosure in Sullivan of a light emitting device that emits UV-light. In fact, Sullivan clearly mentions a device with LEDs emitting light in the IR and visible range. (Sullivan at col. 5, lines 47-50).

In contrast, claim 58 recites a system that has an LED or a nanostructure light-emitting device which emits light in the ultra-violet range. Specifically, the emitted wavelengths are suitable for treating various disease conditions such as lupus, psoriasis, or for stimulating hair growth or to whiten teeth in conjunction with a tooth whitening agent.

To anticipate a claim the prior art must teach each and every limitation of the claimed subject matter. Sullivan, does not teach a UV light emitting device, nor does Sullivan teach or inform a skilled artisan that a UV-light of suitable wavelength can be used for a specific therapeutic indication. Furthermore, Sullivan is silent about a nanostructure light emitting device as claimed. Claim 58, therefore, is not anticipated by Sullivan.

Independent claim 68 recites a method for conducting phototherapy. According to the claimed method, a lightemitting device, such as an LED or a nanostructure device is used to

provide **UV-light** of a particular wavelength, such as a wavelength suitable for treating lupus, psoriasis or for promoting hair growth or whitening teeth.

For the same reasons mentioned above for claim 58, Sullivan does not anticipate claim 68. Sullivan neither teaches nor suggests LEDs that emit UV-light, much less the limitation of a nanostructure light-emitting device as recited by claim 68. Furthermore, Sullivan is silent about using UV-light of a specific wavelength for specific phototherapeutic applications. Claim 68, thus, is not anticipated by Sullivan.

Claims 59, 62 and 66-67 depend from independent claim 58 and incorporate all its limitations. For at least the reasons mentioned above for claim 58, the dependent claims are also considered patentable over Sullivan. Likewise, claims 72 and 77 depend from claim 68 and incorporate all its limitations. These claims are considered patentable over Sullivan for at least the same reasons mentioned above for claim 68.

Applicant therefore respectfully request the Examiner to withdraw the §102 rejections.

Rejections Under 35 U.S.C. 103(a)

The PTO rejects claims 58-77 as allegedly unpatentable over Doty et al., (U.S. Patent No. 5,374,825) in view of Lieber et al., (U.S. Patent No. 7,254,151). According to the PTO, Doty et al., teach a tanning device that has a chamber and a plurality of light sources for emitting UV-light onto a subject's skin. Although, the PTO acknowledges that Doty et al., does not teach or suggest a device that has LEDs or a nanostructure light emitting device as claimed, the Office states that "the use of LEDs for emitting tissue treatment or tanning energy is known in the art". See Office Action, page 4, 4th paragraph. According to the Office,

Therefore, at the time of the applicant's invention, it would have been obvious to one of ordinary skill in the art to use LEDs as an equivalent alternative light sources to provide the therapeutic light, or a nanostructure device pumped with short wavelength UV light to produce a longer wavelength UV light for tanning the skin of the subject. The use of nanostructure element to shift shorter wavelength UV light such as UVC or UVB, to a longer UVA light would reduce exposure of damaging shorter UV wavelengths to the subject's skin.

See Office Action, page 4, 5th paragraph.

Yet the PTO fails to provide any references to support its statements. The Office Action does not illuminate any documents indicating that the use of LEDs for emitting tissue treatment or tanning energy was known in the art, at the time of filing of the present application. Further, the present Office Action fails to provide any support for its statement about the use of LEDs as an equivalent alternative light source. Moreover, the statements that the cited references disclose “the use of a nanostructure element to shift shorter wavelength UV light such as UVC or UVB, to a longer UVA light... [to] reduce exposure of damaging shorter UV wavelengths to a subject's skin” are improper because they are not supported by the disclosures of either Doty or Lieber. As such, the Office Action has failed to reference the sections of the cited documents where support for these statements can be found.

To remedy the absence of any teaching in Doty about nanostructure UV light emitting devices, the PTO cites Lieber et al. However, the combination of Lieber and Doty still fails to teach the system of claim 58 or the method of claim 68, Applicant respectfully traverses the obviousness rejection as being improper.

Doty teaches an apparatus and a method for measuring and controlling the amount of UV-exposure during tanning. In Doty's apparatus UV-light is emitted by UV halogen lamps and not by LEDs or nanostructure devices. There is no teaching or suggestion in Doty, however, of using UV-light in phototherapy, much less a suggestion for addressing specific biological conditions with UV-light of a certain wavelength. In fact, Doty discloses semiconductor photodetectors for detecting UV light, but not LEDs or nanostructure UV light emitters as claimed. Stated differently, Doty teaches photodiodes for detecting UV light and

not for use as a light emitting diode. Doty therefore does not teach or suggest the claimed invention.

The Lieber reference focuses on nanoscale optical components such as LEDs lasers and waveguides. In particular, Lieber discloses methods for making nanoscopic wires and their assembly on surfaces for making nanoscale components. Nowhere, does Lieber teach or even suggest using the nanowires or components made using the nanowires for phototherapeutic applications, much less for therapeutic indications such as lupus, hair growth, psoriasis and teeth whitening as recited by independent claims 58 and 68.

Although Lieber discloses exciting a nanowire waveguide using UV-light, (Lieber, col. 28, example 6), contrary to the statement on page 4 of the Office Action, Lieber **does not** disclose that the light emitted is of a specific wavelength in the UV range and is suitable for phototherapy. In fact, there is no suggestion in Lieber of using the nanowires or a system containing the nanowires for the claimed therapeutic applications.

Moreover, combining Lieber's teachings with those of Doty, would still fail to arrive at the claimed invention, because neither reference teaches or suggests UV-light emitting devices for the claimed phototherapeutic applications.

To support a case of *prima facie* obviousness, the MPEP §2142 states that:

The key to supporting any rejection under 35 U.S.C. 103(a) is the clear articulation of the reason(s) why the claimed invention would have been obvious.

Furthermore, §2143 of the MPEP states that "obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so and as a guard against using hindsight in an obviousness analysis. *In re Kahn*, 441 F.3d 977, 986, 78 USPQ2d 1329, 1335 (Fed. Cir. 2006). Neither Doty nor Lieber teach, suggest or provide a reason for using nanostructure light emitting devices in phototherapy, and the Office Action has failed to clearly articulate why a person of ordinary skill would modify Doty's digital tanning monitor

with nanowires disclosed by Leiber, especially when such a combination would still fail to arrive at a system for phototherapy. The rejection is based on impermissible hindsight reconstruction. Thus, for the reasons mentioned above, Applicant respectfully submits that claim 58 is patentable over the combined teachings of Doty and Leiber.

Additionally, the remarks presented for overcoming the obviousness rejection of claim 58 also apply to independent claim 68. Thus, claim 68 is submitted to be patentable over the combined teachings of Doty and Leiber.

The claims that depend on independent claims 58 and 68 incorporate all their limitations. Thus, the dependent claims are submitted to be patentable for at least the same reasons mentioned for their respective independent claims.

All pending claims are submitted to be in condition for allowance and Applicant respectfully requests the Examiner to withdraw the rejections of claims 58-77.

CONCLUSION

Applicant believes that the present application is in condition for allowance. The Examiner, therefore, is invited to contact the undersigned attorney should any further issues remain.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16 - 1.17, or credit any overpayment, to the same deposit account. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to the same deposit account.

Respectfully submitted,

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